

Aspects of learning style and labour market entry: an explorative study

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Aspects of learning style and labour market entry an explorative study

ROA-RM-1999/4E

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Contents

	Page
Abstract	i
1 Introduction	1
2 Theoretical background	2
3 Data and methodology	4
4 Results	6
5 Conclusion	17
References	19
Appendix 1	23
Appendix 2	25

Abstract

Since 'soft factors' gain more interest for their relevance for the labour market, this study explores the effect of learning style on labour market entry. Learning style is considered to be a relative stable educational concept representing an individual's learning preferences. This study links the educational concept of learning style with labour market research. The sample has been composed of graduates in Economics of the Maastricht University who graduated in between 1991 and 1995. They all started their studies in 1986 or 1987, in which years their learning style data were collected. Learning style aspects were tested for their effect on job chances, quality of work and type of job (job match) at the time of the survey one and a half year after graduation. Analyses were applied within a two step model. In the first step only learning style data and control variables were included. In the second step, relevant covariates like study results were included in the analyses in addition to the learning style data. Logistic and normal linear regression analyses point out that the motivational aspects of learning style tend to have an effect on most of the labour market indicators, whereas the cognitive information processing aspects merely affect the chance of getting an academic job. Results of multinomial logistic regression analyses reveal some effects on entering an accounting job in comparison with a managing job (job match). The learning style aspect 'holism' shows a limited, although unexpected positive effect in this respect. For globalism a negative effect on entering an accounting job appeared. Extendedness appeared to have a limited negative effect on entering an accounting job as well. For research jobs in comparison with managing jobs, no effects are found. Altogether, the effects of learning style aspects appear to be more profound than the effects of study results with respect to labour market entry. Implications and limitations of the study are discussed.

1 Introduction

Recent demands for people at the workplace are described by modern concepts like flexibility and ability to learn. The capacity of employees to adapt to new skill requirements that result from technological developments and global market dynamics is especially stressed (IRDAC, 1990; WRR, 1995; European Commission, 1996). This implies that important concepts under consideration for research into what makes people successful in labour market functioning are related to learning behaviour. In order to become and stay employable, worker's capacity for life-long learning becomes crucial.

In labour market research, educational and skill requirements are considered to be of great importance for successful labour market functioning. However, despite this importance, sociologists and economists have very much considered the educational process as a black box. At best, education has been measured in number of years of education followed, or in terms of educational outcomes by grades, but the actual content of education or learning processes has been left to the domain of educational research. Educational research in turn has neglected the actual outcomes of education in terms of the effect on successful labour market entry and functioning. This research field, however, acknowledged the importance of individual differences in learning for learning outcomes. Already since the sixties and seventies the concept of 'learning style' was used. Learning style refers to a set of individual characteristics which are relevant for individual differences i.e. preferences in the learning process (Biggs, 1993). It may be conceived as a relative stable trait of people. This stability stresses the question to what extent learning behaviour can be developed or changed. However, since growing emphasis is put on the importance of individual skills and differences for labour market functioning (Nijhof, 1997), the existing concept and measurement of 'learning style' from within the educational context may be valuable for analysing differences in labour market functioning. Not only learning outcomes may be affected by differences in learning behaviour or preferences, but labour market outcomes as well. And since learning continues after entering the labour market, the concept of learning style may be important during the further stages of working life as well, possibly related to employability.

Interesting research questions in this respect are: To what extent does learning style predict successful labour market entry? Can learning style predict the kind of job people obtain within a certain range of possibilities, matching their preferences related to learning? Does learning style predict employability?

This paper will take a first step by exploring the predictive effect of students' learning style measured during education for labour market entry. Because learning style refers to 'preferences' in behaviour, both labour market success in quantitative terms and the allocation to different types of jobs will be considered. A sample of graduates in Economics of Maastricht University will be used. The research question we address is: To what extent does learning style predict labour market entry features of graduates?

2 Theoretical background

Traditional labour market research recognizes the importance of education for the labour market. There are mainly two hypotheses: in the human capital theory education is considered to enhance people's productivity directly (Becker, 1964). More education means in this view more productivity. In the screening hypothesis on the other hand, education is considered to reflect desired capacities for employers (Thurow, 1975). In this view people have productive value in tendency for employers, but the real productivity will be developed on the job. Study results traditionally reflect the educational outcomes that are of importance: study results are widely considered to be used as screening devices by employers. However, the emphasis is now put on more individual characteristics in selection practice. And the question rises what these characteristics are exactly and how to measure them.

General skills pertaining to cognitive abilities, personal characteristics and learning skills, are considered as key qualifications for people (e.g. Nijhof, 1997), but it remains unclear in most labour market research how these concepts can be measured. Presland (1994) advocates the use of the learning style concept because of its relevance for continuous development during work. We think the educational concept of learning style has something to offer in this case, although the concept itself still lacks a clear theoretical framework (Rayner & Riding, 1997).

Roughly two views have been developed in learning style research (Biggs, 1993); a narrow view, which emphasizes the cognitive information processing part of learning (for example Kolb, 1976; Kolb, 1984; Schmeck et al., 1977) and a broad view, which implicates several other aspects, in addition to the cognitive processing parts, like motivation and regulation preferences of individuals (for example Entwistle et al., 1979; Nuy, 1991; Vermunt, 1992). In this broad view, an individual's learning style consists of a particular combination of cognitive information processing, regulation aspects and motivational aspects. In general, distinctions in three or four different learning styles are well accepted, as more or less prototypes of learning style. However, the styles are estimated using various composite measurements, depending on the instruments used.

A distinction in three learning style types, that can be described as being reproductive, achievement oriented, and meaning oriented, is rather common though (Entwistle et al., 1979; Nuy, 1991). The meaning oriented style is considered the desirable one; people scoring high on its scales can be characterized by having a large intrinsic motivation, by being disciplined and using cognitive information processing techniques like trying to have an overview, to use concrete examples and elaborate study materials by personal experiences. All in all, the study material is handled to obtain 'meaning'. The reproductive style is in this way more aimed at trying to remember the material and the achievement style at trying to obtain good study results no matter what.

When considering one learning style as being desirable, the question rises to what extent the learning style can be developed or changed?

From educational research findings the answer seems to be 'yes' to a certain extent; several factors affect learning style, such as teaching style (Borg & Shapiro, 1996), kind of tasks (Tsang, 1993), and the educational system or context (Eklund-Myrskog, 1997; Nuy, 1991; Nuy & Moust, 1990). Thus, it should be possible to manipulate students' learning behaviour with the 'right' tasks, the right teaching style and the right system. It depends on the perspective on 'right' and 'desirable'. Research has been aimed frequently at the effects of learning style on learning outcomes (Crombach et al., 1975; Smit & Van Os, 1985; Vermunt, 1992), but the relationship is not conclusive. Probably, the factors affecting learning style do play a role in this. Gijssels et al (1989) studied the effect of learning style on study outcomes and concluded the educational system had affected students' learning style into an 'undesirable' direction.

When learning style is considered rather stable, but on the other hand, can be developed to a certain extent as well, what are the consequences for predicting labour market entry features from learning style measured during education? In this case it seems important to analyse the predictive value of both study results and learning style at the same time to find out whether first of all there are any effects of learning style measured during education on labour market outcomes, and second whether these effects would be merely direct, or indirect, i.e. that the effects are mediated by study results. In the case the effect is independent from study results one could argue the learning style concept has much value for labour market research. When its effects would merely be indirect, meaning study results are stronger indicators for labour market entry features, the concept would not add much value for predicting labour market entry. However, when no effects for learning style could be found, while for study results there could, we should doubt the use of this concept.

It may be possible that learning style is not valuable in predicting a more or less successful labour market entry, but that it regulates the allocation process on the labour market in a more qualitative manner. The question that arises is whether people with different learning style characteristics end up in different jobs? One could argue that for example 'grasping just the main line' during information processing would be positive for a manager, but negative for an accountant, although both graduated in economics. This relates to the matching perspective. In the research field of personnel selection and job analysis, all kinds of individual characteristics have been studied in relation to job characteristics, for example work related values (Judge & Bretz, 1992), cognitive ability (Lancaster et al., 1994) and personality constructs (Raymark et al., 1997). Results show that people tend to choose those jobs that match their abilities, vocational interests and personality (Shrauger & Osberg, 1981; Lancaster et al., 1994). The personal characteristics studied all seem to have a positive effect on job functioning and satisfaction when a match is established. Cognitive ability and specific personality characteristics are considered to be more related to the job, whereas work values are more related to the organization. Despite the argument of its relevance for the working environment (Hayes & Allinson, 1997), the concept of learning style has not been used in this research field. However, it may be possible that the relative stable concept of learning style can tell us something about the kind of job a person chooses.

From different lines of research, learning style seems to potentially have an important effect on differences in labour market position and functioning. Therefore, in this paper, the predictive value of different learning style aspects will be explored with a sample of graduates in Economics of Maastricht University. The research question that will be addressed is: To what extent do learning style aspects predict labour market entry features, when taking the traditional labour market research variables into account?

3 Data and methodology

The data in this study consists of a sample of students of Economics of the Maastricht University, for whom data have been gathered in several subsequent waves. In 1986 and 1987 all first year students were asked to give information about their learning behaviour (Gijssels, 1989). Scales have been constructed to measure the different components of students' learning style, each scale consisting of 6 to 10 items. The items are Likert-type. The sum score on a scale is used to reflect the score of an individual for that scale. Most scales turned out to be very reliable with Alpha of .80 or more. The total range of reliability varied from .60 for globalism to .90 for fear of failure.

One and a half year after graduation, all students received a questionnaire relating to the process of labour market entry. These surveys are carried out on a regular basis by the Research Centre for Education and the Labour Market (Dutch shortcut: ROA) and studies are reported every year with cohorts of graduates of the Maastricht University (see Ramaekers, 1993-1996). For this analysis, data were used from the 1991 to 1995 waves. These waves comprise most of the first-year students who were in the original 1986 and 1987 learning style survey. The resulting sample consists of 156 graduates. Six indicators of labour market entry from the labour market survey are used as dependent variables. These indicators pertain to job chances, quality of work and type of job. The dependents are:

- Being employed at the date of the survey (approximately a year and a half after graduation, referring to job chances).
- Having a job within three months after graduation (referring to job chances).
- Having a permanent job (referring to both job chances and quality of work).
- Having a job for which an academic degree is required (quality of work).
- Gross monthly wages (quality of work).
- Having a managing, an accounting, or a research job (referring to kind of job).

Next to the indicators of labour market success, the particular job in which graduates end up is supposed to be related to the learning style. The classification of jobs into particular types is based on theoretical views used in job choice literature and classifications used in labour market research. The classification of jobs for this study will be dealt with in appendix 1. The learning style data used in this paper relate to a number of different aspects. Table 1 presents an overview of the different scales that are used. The scales can be divided into aspects dealing with cognitive information processing or with motivational aspects. It is beyond the scope of this paper to explore their developmental and theoretical background. Rather,

we will take their relevance as given and explore these aspects in predicting labour market entry features.

Table 1
Meaning of the scales of learning style as defined by Nuy (1991)

Scales	Description of scale content
<i>Cognitive information processing:</i>	
Holism	- Student reacts easily to new study subjects by intuitive knowledge and broad associations; ability to grasp the main point in short time
Globalism	- Studying is limited to the most important points, working up to a rough view of the matter, skipping (possibly relevant) details
Extendedness	- Broad versus narrow scope in exploring study content; locating answers to study questions within a wider context; taking into account different perspectives to describe the subject
Elaboration	- Relating study content to preknowledge and own experience; looking for examples and applications
Construction	- Active and critical incorporation of concepts and theories into a coherent and interconnected body of knowledge
Memorizing	- Learning by heart; concentrating on literal recall
Atomism	- Concentration on specific and isolated elements in the subject matter, which prevents reaching an overview
<i>Motivational aspects:</i>	
Intrinsic motivation	- Interest in study content; challenged by questions and problems
Extrinsic motivation	- Instrumental function of studying
Achievement motivation	- Need to excel; high standards of achievement
Fear of failure	- Avoidance of stress and uncertainty

For the purpose of this study, relevant covariates were considered for their effect on labour market entry as well. By using administrative data for all students, the following covariates have been taken on board:

- Male (dummy);
- Age;
- Study length;
- Study field business administration, core subjects accounting & finance (dummy);
- Study field business administration, core subjects organization & marketing (dummy);
- Study field international management, core subjects accounting & finance (dummy);
- Study field international management, core subjects organization & marketing (dummy);
- Mean study results during the last two years of the graduate study program;
- Final thesis result; grade for the individual final study project.

Logistic and normal linear regression analyses will be applied with respect to the labour market indicators pertaining to job chances and quality of work for the motivational aspects

and the following cognitive information processing aspects: Atomism, Elaboration, Memorizing and Construction.

Multinomial logistic regression analyses will be applied to the type of job graduates obtain with respect to the following cognitive information processing aspects: Holism, Globalism and Extendedness. The reason for including just these three cognitive information processing aspects is the following: when considering the meaning of the scales as described in table 1, the authors interpreted these scales intuitively to be possibly positive for some jobs, but at the same time possibly negative for other jobs. However, the nature of this study is explorative and we therefore do not pretend to have some fundamented reason behind this choice. On the other hand, including all variables into the multinomial logistic regression analyses would not be informative, because of the large number of variables and the modest number of cases. In our opinion, for the other cognitive information processing scales, the different effects for different jobs would be less clear from their content meaning.

Analyses will be applied in a two-step model; in the first step the learning style aspects and covariates age, gender and study length are analysed for their effect on labour market entry. In the second step, the more traditional labour market research variables are introduced into the model: study field and study results. In this way, the gross effect of learning style will be measured by the first-step model and the nett effect in relation to study related independents by the second-step-model.

4 Results

General descriptive statistics

First of all, descriptive results and plots were analysed to screen for outliers and normality. For learning style aspects, no outliers are present and most interval variables show a near normal distribution. Table 2a presents the descriptives of all variables in the analyses, and the Pearson correlations of all variables with the dependents.

Table 2b presents the Pearson correlations between learning style aspects and study results.

As can be seen from table 2b, the correlations between the learning style aspects on the one hand and study results on the other hand are rather limited. The only significant results point to negative effects of Extrinsic Motivation and Memorizing on mean study results. With normal lineair regression analyses, the effects of learning style aspects on study results has been tested; the negative effect of Extrinsic Motivation can be confirmed for mean study results. No other scales sort any effect. For the final thesis variable, various scales have diverse effects, which are not easy to interpret. The only scale that seems to have an effect from the bivariate correlation, Extendedness, does not have any effect on final thesis result in the regression model.

Table 2a
Descriptive statistics and Pearson's correlations

Variables	Mean	SD	N	Correlations								
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Indicators of Labour Market Success</i>												
1) Being employed	0.875	0.332	136	-	-	-	-	-	-	-	-	-
2) Being unemployed less than three months	0.740	0.440	150	-	-	-	-	-	-	-	-	-
3) Having tenure	0.558	0.499	113	-	-	-	-	-	-	-	-	-
4) Having a job requiring an academic degree	0.607	0.491	117	-	-	-	-	-	-	-	-	-
5) Gross monthly wages (log)	8.190	0.300	112	-	-	-	-	-	-	-	-	-
<i>Job Category</i>												
6) Managers	0.350	0.480	71	-	-	-	-	-	-	-	-	-
7) Scientists	0.300	0.460	71	-	-	-	-	-	-	-	-	-
8) Accountants	0.320	0.470	71	-	-	-	-	-	-	-	-	-
9) Other Jobs	0.028	0.170	71	-	-	-	-	-	-	-	-	-
<i>Learning Style Aspects</i>												
Atomism	9.830	4.080	156	0.151*	-0.089	-0.152	-0.149	-0.207**	-	-	-	-
Construction	19.050	4.550	156	0.042	0.159*	-0.110	0.035	0.035	-	-	-	-
Elaboration	18.420	3.090	156	0.104	0.206**	0.010	0.106	0.097	-	-	-	-
Memorizing	8.190	3.920	156	0.031	0.003	-0.026	-0.189**	-0.025	-	-	-	-
Holism	17.090	3.930	156	-	-	-	-	-	0.310***	-0.107	-0.163	-0.142
Globalism	8.880	3.180	156	-	-	-	-	-	-0.200*	0.162	0.080	-0.098
Extendedness	11.350	3.590	156	-	-	-	-	-	-0.049	0.094	-0.013	-0.080*
Intrinsic motivation	15.330	3.620	156	0.071	0.188**	-0.042	-0.006	0.158	-	-	-	-
Extrinsic motivation	13.010	3.950	156	-0.033	-0.069	0.026	0.020	-0.191*	-	-	-	-
Achievement motivation	12.760	4.070	156	0.068	0.217***	0.103	0.063	0.042	-	-	-	-
Fear of failure	8.050	5.120	156	0.060	-0.052	-0.239**	-0.106	-0.271***	-	-	-	-

Table 2a (continued)
Descriptive statistics and Pearson's correlations

Variables	Mean	SD	N	(1)	(2)	(3)	(4)	Correlations (5)	(6)	(7)	(8)	(9)
<i>Control Variables</i>												
Male	0.720	0.450	156	-0.181**	-0.234***	-0.074	0.114	0.033	0.134	-0.006	-0.102	-0.083
Age	25.776	1.509	156	0.017	-0.120	0.086	-0.198**	0.053	0.276**	-0.109	-0.110	-0.185
Study length	66.200	11.060	156	-0.181**	-0.175**	0.108	-0.125	0.116	0.237**	-0.023	-0.145	-0.210*
<i>Study Field</i>												
Business Adm., accounting/finance	0.310	0.460	154	0.081	0.154*	0.122	-0.046	0.059	-0.285**	-0.369**	0.696***	-0.114
Business Adm., organization/marketing	0.300	0.460	154	0.085	-0.005	-0.062	-0.214**	-0.180*	0.103	0.234*	-0.376**	0.110
Intern. Man., acc./fin./general economics	0.097	0.300	155	-0.191**	-0.060	0.089	0.183**	0.248**	0.162	-0.154	0.008	-0.065
Intern. Man., organization/marketing	0.130	0.340	155	-0.078	-0.192**	0.033	-0.005	-0.128	-0.015	0.124	-0.083	-0.065
Other Study Fields (reference)	0.157	0.365	153	-0.040	0.051	-0.179*	0.190**	-0.137	0.086	0.215*	-0.345**	0.128
<i>Study Results</i>												
Mean study results	7.110	0.448	156	0.151*	0.114	-0.001	0.123	0.082	0.087	0.137	-0.200*	-0.064
Final thesis result	7.342	0.856	155	0.296**	0.160**	0.074	0.124	0.174*	0.209*	-0.129	-0.088	0.001

Note 1: * correlation significant at the 0.1 level, ** correlation significant at the 0.05 level and *** correlation significant at the 0.01 level.

Note 2: all information about log gross monthly wages is without considering people working at a dissertation.

Table 2b

Pearson's correlations between learning style aspects and covariates

Variables	Correlations	
	Mean study results	final thesis result
<i>Learning style aspects</i>		
Atomism	-0.053	0.084
Construction	0.010	0.013
Elaboration	0.027	0.085
Memorizing	-0.174**	0.006
Holism	0.060	0.119
Globalism	-0.091	-0.081
Extendedness	-0.020	-0.150*
Intrinsic motivation	-0.014	-0.005
Extrinsic motivation	-0.197**	-0.053
Achievement motivation	0.075	0.003
Fear of failure	-0.005	0.050

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

So far, the learning style scales seem not to have a clear relationship with study results, which makes the possibility that learning style affects labour market entry through affecting study results less convincing.

Regression results for labour market entry chances

Table 3 presents the results of the logistic regression analysis on the first dependent variable, related to job chances: being employed at the date of the survey.

It appears that both models (first- and second-step model) differ significantly from the base model, in which only a constant is included. The learning style aspect Atomism has both in the first and the second-step model a significant positive effect on the odds of being employed a year and a half after graduation. To be precise, a one unit increase in the score on the Atomism scale is related to a multiplicative change in the odds of being employed of 1.25 and 1.43 respectively, which means changes up to 40%. The finding of Atomism being positive related to being employed, is not intuitively clear. Taking the meaning of this cognitive aspect into account (table 1) the effect may be caused by searching behaviour in which every vacant job is possibly interesting, ending up in many applications for vacant jobs and (therefore) a larger chance of success. For all other learning style aspects, no effects are found. Study results appear to have strong positive effects on the chance of having a job. And for the control variables, the larger the study length, the more detrimental it is for the chances of having a job, a year and a half after graduation. Men seem to have more difficulties in finding a job than women, and age appears to have a positive effect, although only in the second model. Finally, studying Business Administration, subjects accounting and finance, has a positive effect on the odds of having a job.

Table 3

Regression estimates of the effects of learning style on having a job

	First-step model		second-step model	
	B	s.e.	B	s.e.
<i>Constant</i>	-2.438	6.698	-43.804***	15.883
<i>Learning Style Aspects</i>				
Atomism	0.222**	0.105	0.358**	0.156
Construction	-0.034	0.092	-0.059	0.125
Elaborism	0.147	0.134	-0.028	0.241
Memorizing	-0.116	0.087	-0.159	0.119
Intrinsic Motivation	-0.062	0.128	0.132	0.167
Extrinsic Motivation	-0.109	0.094	-0.137	0.151
Achievement Motivation	0.062	0.087	0.044	0.136
Fear of Failure	-0.048	0.069	-0.134	0.101
<i>Control Variables</i>				
Male	-1.884*	1.103	-2.884*	1.494
Age	0.447	0.310	1.208**	0.525
Study Length	-0.096**	0.038	-0.151**	0.068
<i>Study Field</i>				
Business Adm., acc./fin.	-	-	2.851*	1.458
Business Adm., org./mark.	-	-	1.572	1.350
Internat.Man., acc./fin./ gen.econ.	-	-	-1.639	1.421
Internat.Man., org./mark.	-	-	0.075	1.223
<i>Study Results</i>				
Mean Study Results	-	-	2.069*	1.122
Final Thesis Result	-	-	1.771***	0.641
<i>Model Statistics</i>				
Number of cases (n)		136		133
Model chi-square		19.573		43.625
df		11		17
p		0.052		0.000
R ² _L		0.191		0.806

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

Table 4 presents the results of the logistic regression on having a job within three months, the next variable related to job chances.

Both the first- and second-step model appear to differ significantly from the base model. With respect to the learning style aspects, Achievement Motivation appears to have a positive effect on having a job within three months. For the other learning style aspects, no profound effects are found. Fear of failure however, seems to indicate a negative effect on finding a job within three months, which is consistent with the apparent meaning of the scale content. No effects of study results were found on this labour market indicator. Being a male seems to be detrimental though, just as study length. The effect of the latter variable disappears in

the second model. Study field International Management, subjects organization and marketing, shows a negative effect.

Table 4

Regression estimates of the effects of learning style on having a job within three months

	First-step model		second-step model	
	B	s.e.	B	s.e
<i>Constant</i>	6.929	4.233	-0.091	7.305
<i>Learning Style Aspects</i>				
Atomism	-0.052	0.067	-0.045	0.073
Construction	-0.039	0.071	-0.030	0.077
Elaborism	0.081	0.099	0.004	0.113
Memorizing	-0.005	0.058	-0.020	0.065
Intrinsic Motivation	0.078	0.090	0.143	0.097
Extrinsic Motivation	0.005	0.064	0.055	0.075
Achievement Motivation	0.118*	0.062	0.151**	0.073
Fear of Failure	-0.081	0.052	-0.118**	0.059
<i>Control Variables</i>				
Male	-1.645**	0.627	-2.113***	0.695
Age	-0.167	0.160	-0.149	0.182
Study Length	-0.036*	0.021	-0.021	0.023
<i>Study Field</i>				
Business Adm., acc./fin.	-	-	0.552	0.822
Business Adm., org./mark.	-	-	-0.869	0.756
Internat. Man., acc./fin./gen.econ.	-	-	-1.422	0.920
Internat. Man., org./mark.	-	-	-1.576*	0.869
<i>Study Results</i>				
Mean Study Results	-	-	0.550	0.600
Final Thesis Result	-	-	0.287	0.276
<i>Model Statistics</i>				
Number of cases (n)		150		147
Model chi-square		28.194		39.737
Df		11		17
P		0.003		0.001
R ² _L		0.164		0.237

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

Table 5 presents the results with respect to the last indicator of labour market chances: having tenure. The results are obtained with logistic regression analyses again.

Both the first- and the second-step model differ significantly from the base model. The most striking result is the negative effect of Construction with regard to its meaning. This effect

could be explained by the fact that most of the academic research jobs are on a temporary basis. The negative effect of Fear of Failure is more in line with our expectations, taking the content meaning of the scale into account. Achievement Motivation shows a positive effect on this labour market indicator. And being a male seems to be detrimental again. Study field variables in the second model do lead to large differences in the odds of having tenure. Studying Business Administration, subjects accounting and/or finance, or studying International Management with the same subjects, leads to a far larger chance of having tenure, than do the other study programmes. Study results, finally, do not show any effect on this labour market indicator.

Table 5
Regression estimates of the effects of learning style on having tenure

	First-step model		second-step model	
	B	s.e.	B	s.e.
<i>Constant</i>	-1.005	4.213	-12.267	7.564
<i>Learning Style Aspects</i>				
Atomism	-0.059	0.070	-0.053	0.076
Construction	-0.199**	0.087	-0.155*	0.091
Elaborism	0.084	0.094	0.005	0.102
Memorizing	0.014	0.059	-0.004	0.065
Intrinsic Motivation	0.050	0.094	0.116	0.101
Extrinsic Motivation	0.022	0.070	0.054	0.079
Achievement Motivation	0.143**	0.065	0.089	0.070
Fear of Failure	-0.119**	0.052	-0.147**	0.058
<i>Control Variables</i>				
Male	-0.448	0.492	-0.951*	0.571
Age	0.042	0.163	0.138	0.183
Study Length	0.019	0.022	0.034	0.025
<i>Study Field</i>				
Business Adm., acc./fin.	-	-	1.842**	0.812
Business Adm., org./mark.	-	-	0.413	0.773
Internat. Man., acc./fin./gen.econ.	-	-	2.008**	1.014
Internat. Man., org./mark.	-	-	0.963	0.888
<i>Study Results</i>				
Mean Study Results	-	-	0.659	0.593
Final Thesis Result	-	-	0.357	0.290
<i>Model Statistics</i>				
Number of cases (n)		113		112
Model chi-square		19.170		29.452
Df		11		17
P		0.058		0.031
R ² _L		0.124		0.237

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

Regression results for labour market quality

The next two variables tested in this study pertain to the quality of work. Table 6 presents the results of the effects on having an academic job, the first of these two variables.

Table 6

Regression estimates of the effects of learning style on having an academic job

	First-step model		second-step model	
	B	s.e.	B	s.e.
<i>Constant</i>	10.421**	4.080	11.852	7.522
<i>Learning Style Aspects</i>				
Atomism	-0.010	0.066	-0.021	0.071
Construction	-0.078	0.079	-0.137	0.087
Elaborism	0.139	0.091	0.182*	0.099
Memorizing	-0.125**	0.060	-0.096	0.067
Intrinsic Motivation	0.028	0.093	0.004	0.099
Extrinsic Motivation	0.019	0.069	0.013	0.074
Achievement Motivation	0.050	0.062	0.068	0.069
Fear of Failure	-0.047	0.052	-0.040	0.054
<i>Control Variables</i>				
Male	0.685	0.489	0.559	0.541
Age	-0.436***	0.157	-0.409**	0.172
Study Length	-0.001	0.022	0.010	0.025
<i>Study Field</i>				
Business Adm., acc./fin.	-	-	-1.469*	0.850
Business Adm., org./mark.	-	-	-1.727**	0.845
Internat. Man., acc./fin./gen. econ.	-	-	0.253	1.314
Internat. Man., org./mark.	-	-	-1.243	0.939
<i>Study Results</i>				
Mean Study Results	-	-	-0.402	0.597
Final Thesis Result	-	-	0.227	0.276
<i>Model Statistics</i>				
Number of cases (n)		117		115
Model chi-square		18.327		27.302
Df		11		17
P		0.074		0.054
R ² _L		0.117		0.214

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

Both models only differ significantly at the 0.1 significance level from the base model. Memorizing appears to have a negative effect on having an academic job. In the second-step model, Elaborism shows a positive effect. A negative effect of age is present in both models. This effect of age seems rather surprising, but is possibly caused by graduates who

finished a study at higher vocational education before entering university. These graduates are in general older and more often inclined to look for a job at higher vocational level. Study fields within the Business Administration course seem to have detrimental effects on this labour market indicator. Study results, finally, appear to have no effects on the odds of having an academic job.

Table 7

Regression estimates of the effects of learning style on gross monthly wages (log)

	First-step model		second-step model	
	B	s.e.	B	s.e
<i>Constant</i>	8.445***	0.049	7.624***	0.740
<i>Learning Style Aspects</i>				
Atomism	-0.002	0.008	-0.006	0.008
Construction	-0.018*	0.009	-0.019**	0.009
Elaborism	0.001	0.011	0.001	0.011
Memorizing	0.001	0.006	0.005	0.007
Intrinsic Motivation	0.023**	0.010	0.022**	0.010
Extrinsic Motivation	-0.009	0.008	-0.008	0.008
Achievement Motivation	0.005	0.007	0.005	0.007
Fear of Failure	-0.014**	0.006	-0.012**	0.006
<i>Control Variables</i>				
Male	0.029	0.054	-0.009	0.056
Age	-0.001	0.017	0.010	0.018
Study Length	-0.001	0.002	0.001	0.002
<i>Study Field</i>				
Business Adm., acc./fin.	-	-	0.025	0.085
Business Adm., org./mark.	-	-	-0.106	0.083
Internat.Man., acc./fin./ gen. econ.	-	-	0.175	0.105
Internat. Man., org./mark.	-	-	-0.071	0.096
<i>Study Results</i>				
Mean Study Results	-	-	0.024	0.059
Final Thesis Result	-	-	0.041	0.033
<i>Model Statistics</i>				
Number of cases (n)		105		103
Adj. R ²		0.065		0.139
F		1.662		1.973
P		0.095		0.022

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

The second variable related to the quality of work is (the log of) gross monthly wages, which will be tested in the next analysis. Graduates who are in a Ph. D. program were left out of this analysis, because their wages are fixed at a very low level, more comparable with a student loan than with regular wages. Table 7 presents the results.

Only the second-step model differs significantly from the base model at the 0.05 level. Intrinsic Motivation shows a stable positive effect on wages. Fear of failure shows a negative effect on wages in both models. Construction shows a negative effect on wages as well, for which no clear argumentation can be given. No effects of study results and control variables are found.

Regression results for obtaining different jobs

To test the effect of the remaining three cognitive learning style aspects on labour market position, a different perspective is used. To see whether high scores on these different aspects would lead to (preference for) a different type of job, multinomial logistic regression is applied, again following the two step method of all other analyses, with exception of the inclusion of the variable study field. Study field is considered to be related to the type of job people obtain, because of relevance of the content. It is considered to be an important selection device for employers. In this way a match between study field and type of job is obvious. Table 8a shows the relation between study field and type of job.

Table 8a
Cross tabulation of study field with job category

Study field	Job category			total
	Managing job	accounting job	research job	
Business Adm., acc./ finance	3	17	1	21
Business Adm., org./ marketing	7	0	8	15
Int. Man., acc./fin./gen.econ.	5	3	1	9
Int. Man., org./marketing	3	2	4	9
Total	18	22	14	54

As can be seen from table 8a, accountants and other employees from the accountant job category are recruited almost exclusively from the study field accounting and finance. Researchers are in general recruited from the study fields organisation and marketing. Only in the case of management jobs recruitment takes place from all possible study fields. Considering the high correlation between study field and type of job we expect that any effect of learning style on the type of job will be mediated through the choice of a specific study field. As we are interested merely in the gross effect of learning style on type of job, we decided to leave the study field variable out of the analyses altogether. Table 8b presents the results of the analysis.

As can be seen from table 8b, in both models effects of learning style aspects are present. In the analysis managing jobs are the reference category. The analysis tests the effects of the independents on the chance to obtain a job from the accounting job category or the research job category, in comparison with the managing job category (for more information about the job categories see appendix 1). The effect of Holism in the first model points to a positive

effect of a high score on the Holism scale on entering an accounting job. No effect appears for entering a research job (in comparison with a manager's job). The effect of Holism is only significant at the 0.1 level and disappears in the second model, however. Globalism shows a negative effect on entering an accounting job in both models. This would mean that scoring high on the Globalism scale would decrease the chances for entering an accounting job, in comparison with a manager's job, which is consistent with our expectation based on the content meaning of the scale; being accurate and precise is extremely important in accountant jobs. Globalism would not be convenient in such jobs. For managing jobs, however, Globalism is (sometimes) inevitable and therefore much more useful. Extendedness shows a negative effect on entering an accounting job in comparison with a manager's job in the second model at the 0.1 level. Again, no effect for entering a research job is found. With respect to the covariates, no effects are found. Higher mean study results, however, seem to be detrimental for entering a research job in the second-step model. This seems rather surprising. Apparently, people with better study results do enter more managing and accounting jobs than research jobs.

Table 8b

Estimates of the effects of learning style on having an accounting job and a research job compared to having a managing job

	First-step model				second-step model			
	<i>Accounting</i> estimate	s.e.	<i>research</i> estimate	s.e.	<i>accounting</i> estimate	s.e.	<i>research</i> estimate	s.e.
<i>Constant</i>	-9.957	6.724	0.217	6.446	-12.050	10.193	14.725	9.835
<i>Learning Style Aspects</i>								
Holism	0.186*	0.102	0.001	0.101	0.167	0.104	0.032	0.107
Globalism	-0.216**	0.105	-0.065	0.100	-0.210*	0.107	-0.063	0.105
Extendedness	-0.152	0.102	-0.079	0.100	-0.184*	0.105	-0.108	0.106
<i>Control Variables</i>								
Male	-0.122	0.392	0.139	0.340	-0.139	0.398	0.087	0.359
Age	0.384	0.275	0.130	0.273	0.380	0.276	0.025	0.277
Study Length	0.008	0.036	-0.029	0.035	0.012	0.038	-0.059	0.041
<i>Study Results</i>								
Mean Study Results	-	-	-	-	-0.233	0.811	-1.775**	0.828
Final Thesis Result	-	-	-	-	0.575	0.457	0.345	0.441
<i>Model Statistics</i>								
Number of cases (n)	69				69			
-2 Log Likelihood	133.309				125.548			

* significant at 0.10, ** significant at 0.05 and *** significant at 0.01.

To summarize the most important results of this paper, table 9 presents the significant outcomes for the learning style and study results variables.

As can be seen from table 9, learning style aspects affect both labour market entry success and type of job. Study results in fact only affect the indicator of having a job in general and obtaining a research job in this study. The effect of study results on having a job seems independent from the effect of the learning style aspect Atomism; the effect of Atomism does not disappear when the study related variables are introduced into the model. However, for the other dependents no profound effects of study results are found at all. The only learning style aspect that appeared to correlate with study results was Memorizing. However, for obtaining an academic job, Memorizing shows a stable negative effect, while study results do not show any effect at all.

Based on the content meaning of the scales, the effects of the motivational aspects of learning style seem rather straightforward, while the effects of the cognitive information processing aspects are far more difficult to explain. In the following and last section, the results of this explorative study will be considered for some conclusive remarks.

Table 9
Results of the analyses

Independents	Being employed	being un-employed < 3 mths	having tenure	Dependents having an academic job	gross monthly wages	accounting job category	research job category
<i>Learning Style Aspects</i>							
Atomism	X+	X	X	X	X		
Construction	X	X	X-	X	X-		
Elaboration	X	X	X	X+	X		
Memorizing	X	X	X	X-	X		
Holism						X+	X
Globalism						X-	X
Extendedness						X-	X
Intrinsic motivation	X	X	X	X	X+		
Extrinsic motivation	X	X	X	X	X		
Achievement motivation	X	X+	X+	X	X		
Fear of failure	X	X-	X-	X	X-		
<i>Study Results</i>							
Mean study results	X+	X	X	X	X	X	X-
Final thesis result	X+	X	X	X	X	X	X
X = the independent variable is included in the analysis. + = effect of the independent variable is positive. - = effect of the independent variable is negative.							

5 Conclusion

In this explorative study the effects of learning style aspects on labour market entry success and type of job have been explored. The following conclusions can be drawn.

Aspects of cognitive information processing appear to affect both labour market chances and quality. Getting an academic job is the one indicator affected by only cognitive learning style aspects; a negative effect of Memorizing and a positive effect of Elaboration appeared. Since Memorizing correlates with study results within our sample, the effect of this aspect seems all the more important. Introducing the study results variables into the model did not diminish the effect of Memorizing, nor revealed an effect of study results variables themselves. For the other indicators of labour market success the effects of information processing aspects were less easy to interpret.

Motivation seems important for both job chances and quality of work. We found positive effects of Intrinsic and Achievement Motivation and negative effects of Fear of Failure, all reasonable to explain. Extrinsic Motivation shows no effect, which in fact means that it has no detrimental effect for labour market entry success.

With respect to the relation between learning style and type of job, the results were not conclusive. Globalism appears to have a negative effect on entering an accounting job in comparison with a managing job, for which we could give some reasonable explanation. On the other hand, we also found a positive effect of Holism and a negative effect of Extendedness on entering an accountant job, in comparison with a managing job. Both effects are not intuitively clear.

Study results only show an effect on the chance of being employed at the time of the survey. On the other indicators of labour market entry success no significant effects were found. This striking outcome seems to suggest that the effects of learning style aspects are more important for explaining labour market entry success than the more traditional labour market research variables.

However, careful choice of the instrument to measure learning style is warranted. Recent findings indicate relevant aspects of learning style as meta-cognition or self-regulating activities. These aspects seem to be very important in learning outcomes (Schouwenburg, 1996; Simons, 1997). Possibly, they will be important in labour market functioning as well. These aspects were not incorporated in the measurement of learning style used in this study.

Further, aspects of the learning style concept can be considered fundamental individual characteristics themselves, like personality traits and differences in brain functioning. The value added by using the learning style concept should therefore be clearly distinguished from these other concepts and possible measurements in further research.

Despite the limitations of the study, we think the results are promising. The findings indicate the importance of individual differences in cognitive information processing and motivational aspects for labour market research. However, we found only an effect on one of the indicators of labour market success. We think that linking the educational concept of learning style with labour market research reveals promising possibilities in extending both research

fields. This is extremely important for both fields, now arriving at the point of integration, forced by the recent developments in the working environment.

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Appendix 1

Job classification

The classification of jobs used in this paper was designed to distinguish a limited number of meaningful categories. To make the categories of jobs as meaningful as possible, an approach is used, which combines ideas of Holland (1985), the division used by Spenner (1985), and the knowledge of job experts working at the Research Centre for Education and the Labour Market (Dutch shortcut ROA).

Based on the findings of Holland (1985) a distinction can be made in six personality types and their preferences for six different environments. Consequently, the work environment type can also be translated in terms of jobs or functions. Holland distinguishes the artistic, the realistic, the intellectual, the social, the entrepreneurial and the conventional type (of personality, environment, job). Being dominantly characterized by one type, persons, environments and jobs do also have characteristics of the other types, to a certain extent. In fact, the typology represents a framework: a hexagram. Persons, environments and jobs can be described by their position on this figure. The characteristics determine the position and some characteristics do relate easier than others, which means they are more consistent than others. In this hexagram there are three 'opposite' characteristics: conventional with artistic, realistic with social and intellectual with entrepreneurial. In formulating a classification of three different groups of jobs, it seems plausible to avoid to cluster these opposite, or inconsistent types. More related types are found more often empirically (Hogerheide, 1994).

In this way, it is defensible to cluster conventional with realistic, intellectual with artistic, and social with entrepreneurial, or conventional with entrepreneurial, social with artistic and intellectual with realistic. In both situations these combinations do have the least distance, which means the largest consistency. However, the first classification appeals more to our approach with respect to differentiating jobs, than the second. Spenner (1985) is talking about "working with people, data, and things" in a study with respect to complexity in work. Working with people can be related to the entrepreneurial/social cluster, working with data to the intellectual/artistic cluster, and working with things to the conventional/realistic cluster. When using the other cluster possibility of Holland's hexagram, the difficulties arise obviously in the intellectual/realistic cluster, where data and things mix. However, in this study a sample of graduates in economics is at hand, for whom possible jobs are by definition of a higher degree in complexity than just dividing them in working with people, things or data. But, when trying to classify the jobs, which are held by our graduates in economics, we can define jobs in which these categories could be reflected by accountants-jobs or computer-jobs (things, conventional/realistic), research-jobs, or didactic jobs (data, intellectual/artistic), and managers-jobs or policy maker/advisory jobs (people, social/entrepreneurial). This classification was double checked by a panel of job experts from ROA.

Appendix 2

Detailed information on table 2a

As can be seen from table 2a, 87.5% of the graduates were employed at the time of the labour market survey. The other 12.5% were unemployed. Some 75% of the graduates did find a job very soon after graduation, and were unemployed less than three months. The other 25% were unemployed for more than three months. Of all employed graduates more than a half (56%) had tenure at the moment of the survey. Additionally, 60% of the graduates held a job for which an academic degree was required, whereas the other 40% were working in a job for which higher vocational education or less was sufficient. The mean gross monthly wages amounted to 3790 Dutch guilders. Of all academically employed graduates, 35% was working in a managing job, 30% in a research or teaching job, and another 32% in an accounting job. A small group of graduates of about 3% was employed in another kind of job, which wasn't defined by the former three categories. The largest part of our sample consists of men (72%), and the mean age at the moment of the labour market survey was nearly 26 years. Most respondents graduated in Business Administration (61%), with equal shares of the core subjects accounting/financing and organisation/marketing. The other 39% consists of graduates in International Management (about 23%), also divided over the two core subjects, and graduates in other subjects, which aren't defined further (the remaining 16%). The mean study length of the graduates in our sample is approximately 66 months, or 5.5 years.

